

IN THE TITLE:

Please change the title of the application as follows:

~~TUBULAR REACTOR FOR CARRYING OUT CATALYTIC GAS~~

~~PHASE REACTIONS AND METHOD FOR OPERATING SAID REACTOR~~

SHELL-AND-TUBE TYPE REACTOR FOR CARRYING OUT CATALYTIC

GASEOUS PHASE REACTIONS AND A PROCEDURE FOR OPERATING THE

SAME

IN THE SPECIFICATION:

On page 1, after the title, insert the following heading:

BACKGROUND OF THE INVENTION

On page 1, lines 1-3, please amend the paragraph to read as follows:

The invention relates to a shell-and-tube type reactor ~~according to the generic terms of patent Claim 1 as well as a procedure for operating such a reactor~~ for carrying out catalytic gaseous phase reactions that comprises: (a) a bundle of contact tubes through which the relevant reaction gas mixture flows, that extend between a gas intake-side tube sheet and a gas output-side tube sheet, that contain a catalytic filling, and that are flushed by a heat transfer medium inside a surrounding reactor shell; (b), a gas intake hood and a gas outlet hood spanning the two tube sheets, respectively, for providing the relevant process gas to the contact tubes and for evacuating the reacted process gas

from the contact tubes; and (c) a process gas main pipe for feeding the process gas into the gas intake hood.

On page 3, after line 16, insert the following heading:

#### SUMMARY OF THE INVENTION

On page 4, lines 1-3, please amend the paragraph to read as follows:

~~This problem is solved by the invention with the features of Claim 1 to which those of the subclaims then make a further contribution~~ This problem is solved, according to the invention by providing a shell-and-tube type reactor wherein the process gas main pipe comprises a first section, in which the process gas is in a non-explosive range, and in process gas flow direction behind it a second section, in which the process gas is in an explosive range; wherein the process gas main pipe comprises in its first section a check valve arrangement; and wherein the check valve arrangement and the gas intake-side tube sheet, and all parts therebetween, which bear the process gas pressure

under normal operation conditions, are designed to withstand the maximum pressure caused by a deflagration or detonation.

On page 4, lines 4-8, please amend the paragraph to read as follows:

Secondly the invention is based on the problem of operating a shell-and-tube type reactor according to the invention by taking commercial advantage of its special properties. This problem is solved by ~~each of the two process Claims 39 and~~ 40 a process wherein at least one of the feed-in points is arranged to receive the associated process gas component in a liquid form and/or wherein said at least one feed-in point has means for injecting the liquid process gas component.

On page 5, delete lines 4-5 and insert the following paragraph and heading:

~~Here below, several embodiment examples of the invention will now be described on the basis of their accompanying drawings.~~

For a full understanding of the present invention, reference should now be made to the following detailed description of the preferred embodiments of the invention as illustrated in the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

On page 5, lines 6-17, please amend the paragraphs to read as follows:

Fig. 1 shows a tube sheet on the gas intake side together with a gas intake hood of a shell-and-tube type reactor according to the invention in a longitudinal half-section<sub>τ</sub>.

Fig. 2 shows a cross-section through the edge of the tube sheet shown in Fig. 1 at the level of Line II-II in Fig. 1<sub>τ</sub>.

Fig. 3 and Fig. 4 show details similar to those in Fig. 1 and Fig. 2 but with an embodiment with a fitting inserted into a conventional gas intake hood for feeding in process gas<sub>τ</sub>.

Fig. 5 shows a semi-longitudinal section similar to the one in Fig. 1 through the tube sheet on the gas intake side and a conventional shell-shaped gas intake hood and a fitting inserted into it similar to the one in Fig. 3<sub>T</sub>.

On page 5, lines 1-13, please amend the paragraphs to read as follows:

Fig. 6a) through Fig. 6f) show in each case an embodiment of a partially permeable seal as illustrated in Fig. 5, in a larger scale<sub>T</sub>.

Fig. 7 shows a similar illustration as Fig. 5 but with another embodiment<sub>T</sub>.

Fig. 8 shows a schematic drawing of a support arranged inside a shell-and-tube type reactor according to the invention, the support supporting in particular the gas intake-side tube sheet<sub>T</sub>.

Fig. 9 shows a schematic drawing of a gas intake hood similar to the one in Fig. 5 with cooling and/or heating devices provided on it<sub>r</sub>.

Fig. 10 shows a similar illustration as Fig. 7 with the devices preceding the process gas stream fed into the reactor, and.

On page 7, before line 1, insert the following heading and paragraph:

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

The preferred embodiments of the present invention will now be described with reference to Figs. 1-11 of the drawings. Identical elements in the various figures are designated with the same reference numerals.

On page 24, after the last line, please insert the following paragraphs:

A shell-and-tube type reactor according to the present invention presents among others the following features and advantages:

The volume of space available to the process gas prior to its entry into the contact tubes can be kept to a minimum according to design and technical flow vantage points.

The space volume available to the process gas prior to its entry into the contact tubes, dead spaces, in which the process gas could fully or partially come to rest, may be avoided as far as possible from design and technical-flow vantage points.

In administering at least the process gas already ready to react diversions and most especially unevenness may be avoided as much as possible.

The gas intake hood (2; 60) may be fastened to the edge of the tube sheet (4) on the gas intake side by means of studs.



The gas intake hood (2; 60) and/or its fitting (42) can be cooled and/or heated.

The gas intake hood (2; 60) and/or its fitting (42) may have canals (160) through which coolant or heat transfer medium can flow.

The support may have a number of longitudinally aligned pressure relief slots (150) and/or recesses (152).

The support may extend up to the tube sheet (148) on the gas output side.

The support is loosely joined to the tube sheet (4; 148) in question.

The support may fit into a recess (142) in the tube sheet (4; 148) in question.

There has thus been shown and described a novel shell-and-tube type reactor for carrying out catalytic gaseous phase reactions and a procedure for operating the same which

fulfills all the objects and advantages sought therefor.  
Many changes, modifications, variations and other uses and  
applications of the subject invention will, however, become  
apparent to those skilled in the art after considering this  
specification and the accompanying drawings which disclose  
the preferred embodiments thereof. All such changes,  
modifications, variations and other uses and applications  
which do not depart from the spirit and scope of the  
invention are deemed to be covered by the invention, which  
is to be limited only by the claims which follow.